

in the United States Patent Office, now US Patent 6,423,099.

TECHNICAL FIELD

The present invention relates generally to a clutch mechanism used in a mechanical grip device, particularly useful as a prosthetic hand. More particularly, the present invention relates to a mechanical grip which is electrically driven and a safety clutch mechanism used to release the mechanical grip.

BACKGROUND

There are an estimated 100,000 individuals with the loss of arms or hands in the United States alone and as many as 10,000 new amputees each year. Research has been carried out in the area of providing prosthetic limbs for many years. The result of this research has provided complex multiple degrees-of-freedom hands, which are too large and complex to be feasible in the marketplace. In contrast, a number of more commercially viable and affordable one-degree-of-freedom hands have been created. These prosthetic hands are combined with powered prosthetic elbows. The hands and elbows are driven by small electric motors. Command signals to drive the powered motors are provided by electrodes which receive electrical signals from the amputee's remaining muscles.

The practical one-degree-of-freedom hands or grips that have become commercially available have a number of shortfalls. One of these problems is the weight of the hands. Prosthetic hands on the market, which have a relatively high gripping force, weigh over 16 ounces. For hands weighing less than 13 ounces, the strength of the grip is cut in half.